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TC 1700

PATENT APPLICATION  
Mo-6064  
LeA 33,087

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICATION OF )  
THOMAS ECKEL ET AL ) GROUP NO.: 1711  
SERIAL NUMBER: 09/720,274 ) EXAMINER: U. K. RAJGURU  
FILED: DECEMBER 21, 2000 ) RESPONSE TO PAPER NO. 8  
TITLE: FLAME RESISTANT POLYCAR- )  
BONATE/ABS PLASTIC MOLDING )  
MATERIALS )

**APPEAL BRIEF**

Assistant Commissioner for Patents  
Washington, D.C. 20231  
Sir:

This Brief, submitted in triplicate, is an appeal from the Final Office Action of the Examiner dated February 26, 2003 in which Claims 1-8 and 12-17 were finally rejected.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an enveloped addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

7/22/03

Date

James R. Franks - Reg. No. 42,552

Name of applicant, assignee or Registered Representative

*James R. Franks*

Signature

July 22, 2003

Date

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### **I. REAL PARTY IN INTEREST**

The real party in interest is Bayer AG.

### **II. RELATED APPEALS AND INTERFERENCES**

There are no other related appeals or interferences known to Appellants, Appellants' legal representative, or Appellants' assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

### **III. STATUS OF THE CLAIMS**

Claims Pending: 1-8 and 12-17

Claims Canceled: None

Claims Allowed: None

Claims Withdrawn  
from Consideration: None

Claims Appealed: 1-8 and 12-17

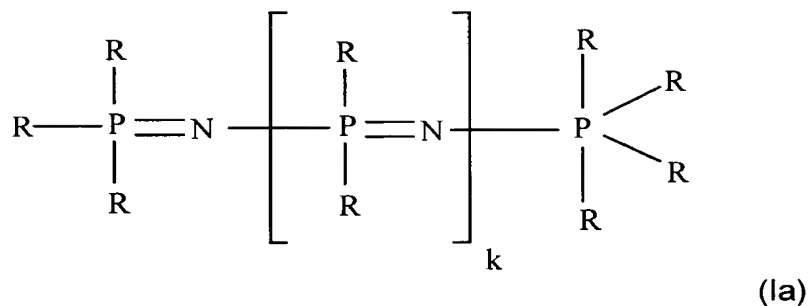
### **IV. STATUS OF AMENDMENTS**

No amendment has been filed subsequent to the outstanding final rejection.

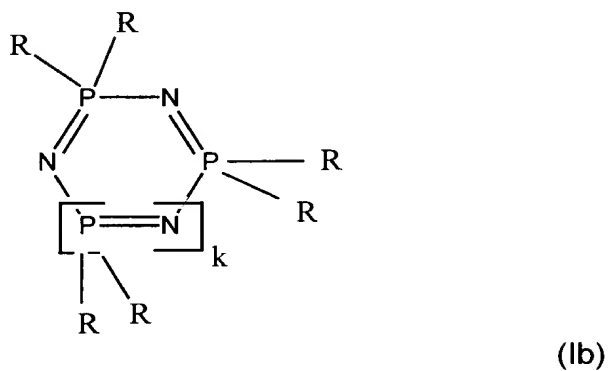
## **V. SUMMARY OF THE INVENTION**

The present invention is directed to a thermoplastic moulding composition containing:

- A) 40 to 99 parts by weight of at least one of aromatic polycarbonate and polyester carbonate;
- B) 0.5 to 60 parts by weight of graft polymer produced by a process selected from the group consisting of bulk polymerization, solution polymerization and bulk/suspension polymerization of
  - B.1) 65 to 98 wt.% of one or more vinyl monomers, and
  - B.2) 2 to 35 wt.% of one or more grafting backbones having a glass transition temperature of  $<10^{\circ}\text{C}$ ,  
said graft polymer having an average particle diameter of 0.5 to 5  $\mu\text{m}$ ,  
and a grafting yield of 2 to 40%;
- C) 0 to 45 parts by weight of at least one thermoplastic polymer selected from the group consisting of vinyl (co)polymers and polyalkylene terephthalates;
- D) 0.1 to 50 parts by weight of at least one component selected from the group consisting of phosphazenes represented by the formulae,



and



in which

R is in each case identical or different and denotes at least one of amino, C<sub>1</sub> to C<sub>6</sub> alkyl, in each case optionally halogenated, C<sub>1</sub> to C<sub>8</sub> alkoxy, C<sub>5</sub> to C<sub>6</sub> cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, C<sub>6</sub> to C<sub>20</sub> aryloxy, C<sub>7</sub> to C<sub>12</sub> aralkyl, in each case optionally substituted by at least one of alkyl, and halogen,

k denotes 0 or a number from 1 to 15; and

E) 0 to 5 parts by weight of fluorinated polyolefin.

## VI. ISSUES

(I) Whether any of Claims 1-8 and 12-17 are unpatentable under 35 U.S.C. §103(a) over European Patent Application No. EP 0 728 811 A2 (**Maruyama et al**).

## VII. GROUPING OF CLAIMS

Claims 1-8 and 12-17 are appealed together.

## VIII. ARGUMENTS

### (I) CLAIMS 1-8 AND 12-17 ARE NOT RENDERED OBVIOUS BY MARUYAMA ET AL.

The Examiner has taken the position that, under 35 U.S.C. §103(a), Claims 1-8 and 12-17 are unpatentable over Maruyama et al. Appellants respectfully disagree with regard to Claims 1-8 and 12-17.

Maruyama et al disclose a flame retardant thermoplastic resin composition that includes: an aromatic polycarbonate; a graft copolymer; optionally a copolymer prepared by copolymerizing an aromatic vinyl monomer and a monomer copolymerizable therewith; a phosphazene; and optionally polytetrafluorethylene. See the abstract; formulas (I) and (II) on page 4; and page 5, lines 5-9 of Maruyama et al.

The graft copolymer of Maruyama et al is disclosed as being prepared by processes, such as emulsion, suspension, solution or bulk polymerization (page 3, lines 43-45). The graft copolymer of Maruyama et al's examples was prepared by means of emulsion polymerization (page 5, line 55 through page 6, line 13).

Maruyama et al do not disclose, teach or suggest the particle size of the graft copolymer of their compositions. Maruyama et al disclose the weight average particle size diameter of the rubber component of their graft copolymer as being 0.10 to 1.50  $\mu\text{m}$ . However, such disclosure by Maruyama et al neither reasonably

reaches nor touches upon the average particle diameter of the final graft polymer of Appellants' present claims, which is from 0.5 to 5  $\mu\text{m}$ .

With regard to preparing the graft copolymer of their compositions, Maruyama et al do not disclose, teach or suggest any preference towards selecting the suspension, solution and/or bulk polymerization methods over the emulsion polymerization process. In fact, as pointed out above, the examples of Maruyama et al make use of a graft copolymer prepared by emulsion polymerization. Further, Maruyama et al do not disclose, teach or suggest that improved properties could be obtained from a flame retardant thermoplastic resin composition comprising a graft copolymer that is prepared by processes other than emulsion polymerization.

The graft copolymer (B) of the compositions of Appellants' present claims are prepared by a process selected only from bulk, solution or bulk/suspension polymerizations (*i.e.*, to the exclusion of emulsion polymerization). The improved and unexpected results that are possessed by the thermoplastic molding compositions of Appellants' claims are demonstrated in the examples on pages 21-25 of the specification. The molding compositions in accordance with Appellants' present invention (*i.e.*, Examples 1-4) include an ABS graft copolymer prepared by means of bulk polymerization, while the comparative composition of Example 5 includes an ABS graft copolymer prepared by means of emulsion polymerization.

The compositions in accordance with Appellants' present claims have improved physical properties, such as a favorable combination of flame resistance and mechanical properties. In addition, the compositions of Appellants' invention poses further advantages with regard to processability, in particular with regard to improved flow behavior (MVR), and a 20% reduction in loss of mass during processing of the compositions. See the Table on page 24 of the specification. In summary, the thermoplastic molding composition of Appellants' present invention has: (i) flame resistance that is at least equivalent to; (ii) mechanical properties that are at least equivalent to; (iii) improved melt behavior; and (iv) a reduction in loss of mass at 280°C, as determined by means of thermogravimetric analysis, relative to a comparative thermoplastic molding composition which includes, in place of graft polymer B), a graft polymer prepared by means of emulsion polymerization. See the Mo-6064

Examples on pages 21-25 of the specification; particularly the table on page 24 of the specification; and more particularly at page 24, line 7 through page 25, line 2 of the specification.

On page 2 of the Office Action of February 26, 2003 it is argued that Appellants' argument as to Maruyama et al's graft copolymer being prepared by means of emulsion polymerization, with reference to the examples thereof, is not persuasive. Appellants respectfully disagree and wish to point out that while Maruyama et al disclose generally the preparation of their graft copolymer by means of emulsion, suspension, solution or bulk polymerization, Maruyama et al provide no disclosure, suggestion or teaching as to excluding emulsion polymerization as a method of graft copolymer preparation. A lack of suggestion or teaching as to such exclusion of emulsion polymerization methods is evidenced by Maruyama et al's examples in which the graft copolymer is prepared by means of emulsion polymerization. In addition, Maruyama et al provide no disclosure, suggestion or teaching as to the improved physical properties that are obtained with the compositions of Appellants' present claims, in which the graft copolymer is prepared by methods that are exclusive of emulsion polymerization.

On page 2 of the Office Action it is argued that Maruyama et al's disclosure as to a particle diameter of 0.10 to 1.50  $\mu\text{m}$  is deemed to overlap with Appellants' claimed average particle diameter of their final graft copolymer, which is 0.5 to 5  $\mu\text{m}$ . Appellants respectfully disagree. Maruyama et al disclose only the particle diameter of an ingredient that is used in the preparation of their graft copolymer, and not the particle diameter of the final graft copolymer itself. Maruyama et al disclose the weight average particle size diameter of the rubber component of their graft copolymer as being 0.10 to 1.50  $\mu\text{m}$  (page 3, lines 21-25). The rubber component is an ingredient used in the preparation of a graft copolymer. As such, the disclosure of Maruyama et al as to the rubber component, of their graft copolymer, having a weight average particle size diameter of 0.10 to 1.50  $\mu\text{m}$  is not deemed to reasonably extend to or touch upon the average particle diameter of Appellants' claimed final graft copolymer, which is 0.5 to 5  $\mu\text{m}$ .


On page 2 of the Office Action, it is argued that Appellants' arguments based on improved properties are not persuasive as their claims do not encompass the limitations of the examples. Appellants respectfully disagree. The graft copolymer of Appellants' claims is prepared by bulk polymerization, solution polymerization or bulk/suspension polymerization. The graft copolymer of Appellants' examples is prepared by means of bulk polymerization. As such, the examples are deemed to provide support for Appellants' claims.

In light of the preceding remarks, Appellants' Claims 1-8 and 12-17 are deemed to be unobvious and patentable over Maruyama et al.

Appellants note with appreciation the withdrawal of the rejection of Claims 1-8, 12 and 13 as being anticipated by Maruyama et al., on page 2 of the Office Action.

In view of the remarks herein, Appellants respectfully submit that their claimed thermoplastic molding composition is not described, taught or fairly suggested by Maruyama et al. Thus, Appellants respectfully request that the Board of Appeals reverse the decision of the Examiner, and remand the application for allowance of Claims 1-8 and 12-17 and issuance of a patent.

Respectfully submitted,

By   
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Reg. No. 42,552

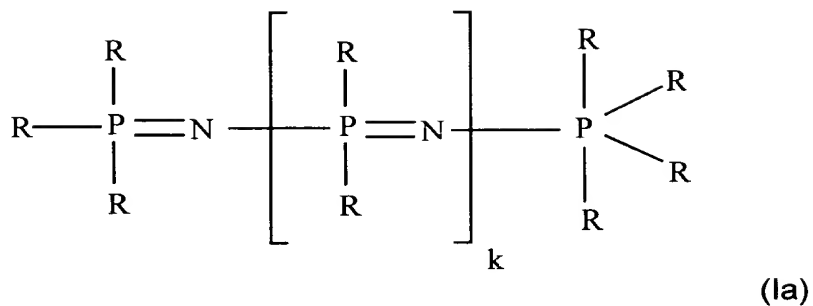
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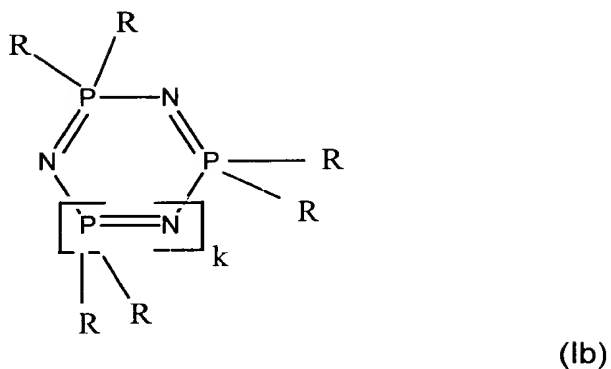


**APPENDIX**  
**CLAIMS ON APPEAL**

1. A thermoplastic moulding composition containing:
  - A) 40 to 99 parts by weight of at least one of aromatic polycarbonate and polyester carbonate;
  - B) 0.5 to 60 parts by weight of graft polymer produced by a process selected from the group consisting of bulk polymerization, solution polymerization and bulk/suspension polymerization of
    - B.1) 65 to 98 wt.% of one or more vinyl monomers, and
    - B.2) 2 to 35 wt.% of one or more grafting backbones having a glass transition temperature of  $<10^{\circ}\text{C}$ ,  
said graft polymer having an average particle diameter of 0.5 to 5  $\mu\text{m}$ , and a grafting yield of 2 to 40%;
  - C) 0 to 45 parts by weight of at least one thermoplastic polymer selected from the group consisting of vinyl (co)polymers and polyalkylene terephthalates;
  - D) 0.1 to 50 parts by weight of at least one component selected from the group consisting of phosphazenes represented by the formulae,



and



in which

R is in each case identical or different and denotes at least one of amino, C<sub>1</sub> to C<sub>6</sub> alkyl, in each case optionally halogenated, C<sub>1</sub> to C<sub>8</sub> alkoxy, C<sub>5</sub> to C<sub>6</sub> cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, C<sub>6</sub> to C<sub>20</sub> aryloxy, C<sub>7</sub> to C<sub>12</sub> aralkyl, in each case optionally substituted by at least one of alkyl, and halogen,

k denotes 0 or a number from 1 to 15; and

E) 0 to 5 parts by weight of fluorinated polyolefin.

2. The moulding composition of Claim 1 containing:  
60 to 98.5 parts by weight of A;

1 to 40 parts by weight of B;  
0 to 30 parts by weight of C;  
2 to 35 parts by weight of D; and  
0.1 to 1 part by weight of E.

3. The moulding composition of Claim 1 containing 2 to 25 parts by weight of C.

4. The moulding composition of Claim 1 containing 5 to 25 parts by weight of D.

5. The moulding composition of Claim 1 wherein vinyl monomers B.1 are mixtures prepared from

B.1.1 a first vinyl monomer selected from at least one of styrene,  $\alpha$ -methylstyrene, halo- or alkyl-ring-substituted styrenes and (meth)acrylic acid  $C_1$ - $C_8$  alkyl esters, and

B.1.2 a second vinyl monomer selected from at least one of unsaturated nitriles, (meth)acrylic acid  $C_1$ - $C_8$  alkyl esters and derivatives of unsaturated carboxylic acids.

6. The moulding composition of Claim 1 wherein the grafting backbone B.2 is at least one rubber selected from the group consisting of diene rubbers, EP(D)M rubbers, acrylate, polyurethane, silicone, chloroprene and ethylene/vinyl acetate rubber.

7. The moulding composition of Claim 1 containing at least one additive selected from the group consisting of lubricants, mould release agents, nucleating agents, anti-static agents, stabilisers, dyes and pigments.

8. The moulding composition of Claim 1 containing further flame retardants which differ from component D.
12. A molded article comprising the composition of Claim 1.
13. The thermoplastic moulding composition of Claim 1 wherein graft polymer B) is prepared by bulk polymerization.
14. The thermoplastic moulding composition of Claim 1 wherein graft polymer B) has an average particle diameter of 0.8 to 2.5  $\mu\text{m}$ .
15. The thermoplastic moulding composition of Claim 1 wherein graft polymer B) is produced by polymerization of 75 to 97 wt. % of B.1), and 2 to 15 wt. % of B.2).
16. The thermoplastic moulding composition of Claim 1 wherein said graft copolymer B) has a grafting yield of 3 to 30%.
17. The thermoplastic moulding composition of Claim 1 wherein said graft copolymer B) has a grafting yield of 4 to 20%.